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SPECIFICATION FOR ZIRCON SAND FOR USE IN FOUNDRIES

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Indian Standard

SPECIFICATION FOR ZIRCON SAND FOR USE IN FOUNDRIES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 18 December 1978, after the draft finalized by the Foundry Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 Zircon sand has been found to be highly suitable for use in foundries as a basic mould/core making material for applications where high refractoriness is desired. The distinguishing features of zircon sand are its usually small particle size, low linear expansion which is one-sixth that of silica sand, high thermal conductivity, high density, high refractoriness and chemical inertness.

0.2.1 By virtue of its high thermal conductivity and high density as compared to silica sand, zircon sand can abstract much more heat than silica sand and therefore can be used to achieve directional solidification in castings.

0.2.1.1 Zircon sand thus finds very wide applications in the production of high manganese steel castings, by virtue of the above mentioned properties.

0.3 For determining the fineness of zircon sand, the aperture sizes are based on IS : 460-1962*. Where IS sieves are not available, other equivalent standard sieves may be used. For the purpose of comparison, the corresponding BS and ASTM test sieve numbers are given in Appendix A.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the quality requirements for zircon sand for use in foundries.

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*Specification for test sieves (*revised*).

†Rules for rounding off numerical values (*revised*).

2. GRADES

2.1 Zircon sand for use in foundries shall be of three grades, namely, Grades 1, 2 and 3 based on particle distribution.

3. SUPPLY OF MATERIAL

3.1 General requirements relating to supply of zircon sand for use in foundries shall conform to IS : 1387-1967*.

4. MANUFACTURE

4.1 The sand is obtained by processing natural beach sand deposits rich in heavy minerals.

5. CHEMICAL COMPOSITION

5.1 Zircon sand shall have the following chemical composition on dry mass basis:

Constituent	*Percent*
ZrO_2	65 *Min*
SiO_2	30-35
TiO_2	0·6 *Max*
Fe_2O_3	0·15 *Max*

NOTE — Indian Standard Methods of chemical analysis of zircon sand is under preparation.

6. CLAY CONTENT

6.1 The clay content of all the three grades of zircon sand, when tested in accordance with the procedure specified in IS : 1918-1966†, shall be nil.

7. MOISTURE CONTENT

7.1 Moisture content of zircon sand shall be 0·1 percent, *Max.*

8. GRAIN SHAPE

8.1 Sand grain shape shall be predominantly rounded (*see* IS : 1918-1966†).

9. GRAIN FINENESS

9.1 The particle size distribution of different grades of zircon sand shall conform to the requirements specified in Table 1.

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*General requirements for the supply of metallurgical materials (*first revision*).

†Methods of physical tests for foundry sands.

TABLE 1 GRAIN FINENESS OF ZIRCON SAND

(*Clause* 9.1)

IS SIEVE (MICRON)	GRADE 1 PERCENT, *Max*	GRADE 2 PERCENT, *Max*	GRADE 3 PERCENT, *Max*
+212	25	10	10
−106	10	10	25
− 75	2	2	2

10. PACKING

10.1 The sand shall be supplied in appropriate gunny bags of 50 kg capacity.

11. MARKING

11.1 The bags shall be clearly marked with the manufacturer's name, trade-mark and grade of material.

11.1.1 The material may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

12. SAMPLING

12.1 Representative samples shall be drawn according to the scheme of sampling given in IS : 1811-1961*.

APPENDIX A

(*Clause* 0.3)

COMPARATIVE SIEVE DESIGNATIONS OF IS, BS AND ASTM TEST SIEVES

IS Sieve	*BS Test Sieve*	*ASTM Test Sieve*
212-micron	72	70
106-micron	150	140
75-micron	200	200

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*Methods of sampling foundry sands.

(*Continued from page* 2)

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